

WHAT IS CLAIMED IS:

- 1 1. A method for maintaining a link between a first network entity and a
2 second network entity, wherein the first network entity includes a network adapter and a
3 driver, comprising:
4 determining, with the network adapter, whether the driver was loaded before a
5 link-shutdown timer expired, wherein the link-shutdown timer is associated with the link;
6 continuing processing without dropping the link, with the network adapter, in
7 response to the driver being loaded before the link-shutdown timer expired; and
8 dropping the link, with the network adapter, in response to the driver not being
9 loaded before the link-shutdown timer expired.
- 1 2. The method of claim 1, further performing:
2 determining, with the network adapter, whether a register has a value indicating
3 that the driver has been loaded.
- 1 3. The method of claim 1, further performing:
2 determining, with the network adapter, whether the link-shutdown timer has
3 expired; and
4 periodically determining, with the network adapter, whether the driver was loaded
5 in response to determining that the link-shutdown timer has not expired.
- 1 4. The method of claim 1, further performing:
2 determining, with the network adapter, whether the link-shutdown timer has
3 expired; and
4 periodically determining, with the network adapter, whether the driver was loaded
5 in response to the driver not being loaded and the link-shutdown timer not having
6 expired.

1 5. A method implemented in a driver executing in a first network entity for
2 maintaining a link between the first network entity and a second network entity, wherein
3 the driver performs:
4 starting a link-shutdown timer for dropping a link;
5 upon being reloaded, determining whether the link is available; and
6 continuing processing without renegotiating the link in response to the link being
7 available.

1 6. The method of claim 5, wherein the driver further performs:
2 renegotiating the link in response to the link being available.

1 7. The method of claim 5, wherein the driver further performs:
2 determining, whether flow control is enabled; and
3 sending an indicator to the second network entity to indicate that the second
4 network entity is to stop sending data packets to the first network entity in response to
5 flow control being enabled.

1 8. The method of claim 7, wherein after the driver is reloaded, the driver
2 further performs:
3 determining whether flow control is enabled; and
4 sending an indicator to the second network entity to indicate that the second
5 network entity is to start sending data packets to the first network entity in response to
6 flow control being enabled.

1 9. The method of claim 5, further performing:
2 when the driver is reloaded, disabling the link-shutdown timer in response to the
3 link-shutdown timer being enabled and not being expired.

1 10. A system coupled to a network and data storage, comprising:
2 a storage controller managing Input/Output (I/O) access to the data storage;
3 at least one driver;
4 a network adapter; and
5 control logic to cause the network adapter to perform operations, the operations
6 comprising:
7 (i) determining, with the network adapter, whether the driver was
8 loaded before a link-shutdown timer expired;
9 (ii) continuing processing without dropping a link for which the link-
10 shutdown timer was started in response to the driver being loaded before the link-
11 shutdown timer expired; and
12 (iii) dropping the link in response to the driver not being loaded before
13 the link-shutdown timer expired.

1 11. The network adapter of claim 10, wherein the operations caused by the
2 control logic further comprise:
3 determining whether a register has a value indicating that the driver has been
4 loaded.

1 12. The network adapter of claim 10, wherein the operations caused by the
2 control logic further comprise:
3 determining whether the link-shutdown timer has expired; and
4 periodically determining whether the driver was loaded before the link-shutdown
5 timer expired in response to determining that the link-shutdown timer has not expired.

1 13. The network adapter of claim 10, wherein the operations caused by the
2 control logic further comprise:
3 determining whether the link-shutdown timer has expired; and
4 periodically determining whether the driver was loaded in response to the driver
5 not being loaded and the link-shutdown timer not having expired.

1 14. A system coupled to a network and data storage, comprising:
2 a processor;
3 a storage controller managing Input/Output (I/O) access to the data storage; and
4 a driver, executed by the processor, to perform operations, the operations
5 comprising:
6 (i) starting a link-shutdown timer for dropping a link;
7 (ii) upon being reloaded, determining whether the link is available;
8 and
9 (iii) continuing processing without renegotiating the link in response to
10 the link being available.

1 15. The system of claim 14, wherein the operations further comprise:
2 renegotiating the link in response to the link not being available.

1 16. The system of claim 14, wherein the operations further comprise:
2 determining whether flow control is enabled; and
3 sending an indicator to the second network entity to indicate that the second
4 network entity is to stop sending data packets to the first network entity in response to
5 flow control being enabled.

1 17. The system of claim 16, wherein after the driver is loaded, the operations
2 further comprise:
3 determining whether flow control is enabled; and
4 sending an indicator to the second network entity to indicate that the second
5 network entity is to start sending data packets to the first network entity in response to
6 flow control being enabled.

1 18. The system of claim 14, wherein the operations further comprise:
2 when the driver is reloaded, disabling the link-shutdown timer in response to the
3 link-shutdown timer being enabled and not being expired.

1 19. An article of manufacture for maintaining a link between a first computer
2 and a network entity, wherein the first computer includes a network adapter and a driver,
3 and wherein the article of manufacture causes operations to be performed in the network
4 adapter, the operations comprising:
5 (i) determining, with the network adapter, whether the driver was
6 loaded before a link-shutdown timer expired, wherein the link-shutdown timer is
7 associated with the link;
8 (ii) continuing processing without dropping the link in response to the
9 driver being loaded before the link-shutdown timer expired; and
10 (iii) dropping the link in response to the driver not being loaded before
11 the link-shutdown timer expired.

1 20. The article of manufacture of claim 19, wherein the operations further
2 comprise:
3 determining whether a register has a value indicating that the driver has been
4 loaded.

1 21. The article of manufacture of claim 19, wherein the operations further
2 comprise:
3 determining whether the link-shutdown timer has expired; and
4 periodically determining whether the driver was loaded before the link-shutdown
5 timer expired in response to determining that the link-shutdown timer has not expired.

1 22. The article of manufacture of claim 19, wherein the operations further
2 comprise:
3 determining whether the link-shutdown timer has expired; and
4 periodically determining whether the driver was loaded in response to the driver
5 not being loaded and the link-shutdown timer not having expired.

1 23. An article of manufacture for maintaining a link between a first computer
2 and a network entity, wherein the first computer includes a driver, and wherein the article
3 of manufacture causes operations to be performed in the driver, the operations
4 comprising:
5 starting a link-shutdown timer for dropping a link;
6 upon being reloaded, determining whether the link is available; and
7 continuing processing without renegotiating the link in response to the link being
8 available.

1 24. The article of manufacture of claim 23, wherein the operations further
2 comprise:
3 renegotiation the link in response to the link not being available.

1 25. The article of manufacture of claim 23, wherein the operations further
2 comprise:

3 determining, whether flow control is enabled; and
4 sending an indicator to the second network entity to indicate that the second
5 network entity is to stop sending data packets to the first network entity in response to
6 flow control being enabled.

1 26. The article of manufacture of claim 25, wherein after the driver is loaded,
2 the operations further comprise:

3 determining whether flow control is enabled; and
4 sending an indicator to the second network entity to indicate that the second
5 network entity is to start sending data packets to the first network entity in response to
6 flow control being enabled.

1 27. The article of manufacture of claim 23, wherein the operations further
2 comprise:

3 when the driver is reloaded, disabling the link-shutdown timer in response to the
4 link-shutdown timer being enabled and not having expired.